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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,735	07/09/2008	Danny R. Milot	1-25152	2813

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EXAMINER	
NOLAN, PETER D	

ART UNIT	PAPER NUMBER
3661	

MAIL DATE	DELIVERY MODE
03/23/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/593,735	MILOT, DANNY R.	
	Examiner	Art Unit	
	Peter D. Nolan	3661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 March 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1, 2, 4-9, 15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 2, 4-9, 15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The amendment to the claims filed March 9, 2010 has been entered. Claims 3, 10-14 have been cancelled. Claims 1, 2, 4-9, 15 remain pending.

Response to Affidavit

The affidavit filed on March 9, 2010 under 37 CFR 1.131 is sufficient to overcome the Mancuso et al. reference (US 7404317 B2). Therefore the finality of the last office action, dated 10/15/2009, is withdrawn. However, upon further consideration, new grounds of rejection are made in view of Wilson (US 2003/005118 A1).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 5, 9, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watson (US 7057503 B2) in view of Yeh et al. (US 6542073 B2), Clark (US 2005/0033549 A1) and Wilson (US 2003/0058118 A1).

3. **Regarding claim 1**, Watson teaches a method for detecting a potential for a vehicle rollover event (**see Watson abstract**), the method comprising the steps of: determining a lateral kinetic energy of the vehicle based on the vehicle longitudinal velocity and the vehicle side slip angle (**see Watson column 28, lines 25-59 where the**

lateral kinetic energy may be determined as 1/2*mass$_{veh}$*Velocity$_{lat}^2$ and used to detect a potential rollover. It is well known in the art that the relationship between the side slip angle β, longitudinal velocity V_x and lateral velocity V_y is: β = -arctan(V_y/ V_x). Therefore the lateral kinetic energy is inherently based on the vehicle longitudinal velocity and the vehicle side slip angle); measuring a lateral acceleration of the vehicle (**see Watson figure 3, Measures Algorithm 300.1; column 3, lines 8-18; column 4 lines 1-10**);

4. However, while Watson teaches determining a rollover potential based on the lateral kinetic energy and the lateral acceleration (**see Watson column 28, line 53 thru column 29, line 15**), it does not teach determining a rollover potentiality index based on the determined parameters. Furthermore, Watson does not teach measuring a tire load by measuring a length of a contact patch of a vehicle tire and measuring changes to the contact patch length; determining a rollover index by weighing the rollover potentiality index by a factor of the lateral acceleration and a factor of the tire load and determining if the weighted index is above a predetermined threshold.

5. Yeh teaches determining a rollover index based on determined parameters (**see Yeh column 3, lines 27-40**) and determining if a rollover index is above a predetermined threshold (**see Yeh column 3, lines 27-54**).

6. It would be obvious to one skilled in the art to use the indexing function taught in Yeh to create a rollover potentiality index determined from the lateral kinetic energy and the lateral acceleration values determined in Watson because this enables the use of look-up table of predetermined threshold values responsive to the index values (**see**

Yeh column 3, lines 27-40). It would further be obvious to determine if the resulting index is above a predetermined threshold, as further taught in Yeh, because this can signal that a rollover event may occur (**see Yeh column 8, lines 10-15**).

7. Yeh further teaches weighting a rollover index by a factor of the lateral acceleration (**see Yeh column 5, line 63 thru column 6, line 14 where the lateral acceleration may be used to provide a safing function. See also column 8, lines 1-33 where if the rollover value is above a threshold, the output of the safing function is used**).

8. Clark teaches a method for detecting a rollover potential for a vehicle that comprises, in part, measuring a tire load (**see Clark figure 5, loads F_L, F_R and paragraphs 8, 29, 30**) and weighting a rollover potential by a factor of the tire load (**see Clark paragraph 22**).

9. Wilson teaches a method for measuring a tire load comprising measuring a length of a contact patch of a vehicle tire and measuring changes to the contact patch length (**see Wilson Abstract; paragraphs 65-67, 99 and 160-164 where an accelerometer is used to measure the length, and changes in the length, of a contact patch of a vehicle tire. See also paragraph 178 where the load is detected from the measured contact patch length**).

10. It would be obvious to one of ordinary skill in the art to modify the rollover index taught in Watson, as modified with Yeh, with the lateral acceleration as further taught in Yeh because the lateral acceleration provides a safing function for the rollover detection method (**see Yeh column 5, line 63 thru column 6, line 14**). It would further be

obvious to one of ordinary skill in the art to modify the rollover index by a factor of the tire load, as taught in Clark, because the tire load can provide a quick indication of an extreme change in vehicle orientation (**see Clark paragraph 24**). Because both Clark and Wilson teach methods of measuring tire force, it would have been obvious to one of ordinary skill in the art to substitute one method for the other to achieve the predictable result of measuring tire force.

11. **Regarding claim 2**, Watson, as modified by Yeh, Clark and Wilson in claim 1, teaches where the measured tire load is a tire normal load (**see the rejection above regarding loads F_L, F_R**).

12. **Regarding claim 4**, Watson, as modified by Yeh, Clark and Wilson in claim 1, teaches where the length of the contact patch is quantified by at least one of an accelerometer, a pressure sensing mechanism, and a temperature sensing mechanism (**see the rejection of claim 1 regarding Wilson's use of an accelerometer to measure the length of the contact patch**).

13. **Regarding claim 5**, Watson, as modified by Yeh, Clark and Wilson in claim 1, teaches where lateral acceleration of the vehicle is sensed using a lateral acceleration sensor (**see Watson column 3, lines 8-9 and column 5, lines 35-37**); the method further comprising sensing a yaw rate of the vehicle (**see Watson column 31, lines 9-15**), sensing a speed of the vehicle (**see Watson column 31, lines 9-15**), sensing a steering wheel angle of the vehicle (**see Watson column 31, lines 9-15**), and factoring the speed of the vehicle and the steering wheel angle of the vehicle into the rollover index determination (**see Watson column 31, lines 9-15 regarding determination of**

lateral velocity from the speed of the vehicle and the steering wheel angle. See also column 30, lines 52-67).

14. **Regarding claim 9**, Watson, as modified by Yeh, Clark and Wilson in claim 1, teaches where the lateral acceleration of the vehicle is measured by an accelerometer attached to a center of gravity of the vehicle (**see Watson column 3, lines 8-12**).

15. **Regarding claim 15**, Watson, in view of Yeh, Clark and Wilson, teaches an apparatus for detecting a rollover event for a vehicle comprising: (**Watson figure 16, rollover detection system 10 containing lateral accelerometer 18; column 3, lines 8-12; column 27, lines 57-60**; a yaw rate sensor for sensing a yaw rate of the vehicle (**see Watson column 31, lines 9-12**); a sensor for sensing a speed of the vehicle (**see Watson column 31, lines 9-15**); a steering wheel sensor for sensing a steering wheel angle of the vehicle (**see Watson column 31, lines 9-15**); a tire load sensing mechanism for measuring a tire load (**see Clark figure 5, loads F_L, F_R and paragraphs 8, 29, 30**); and a controller configured to factor the speed of the vehicle and the steering wheel angle of the vehicle into the rollover index determination defined in claim 1 (**see the rejection of claim 1 above. See also the rejection of claim 5 above regarding factoring the speed of the vehicle and the steering wheel angle of the vehicle into the rollover index determination defined in claim 1**).

16. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watson (US 7057503 B2) in view of Yeh (US 6542073 B2), Clark (US 2005/0033549 A1) and Wilson (US 2003/0058118 A1) and further in view of Applicant's admitted prior art.

17. **Regarding claim 6**, Watson, as modified by Yeh, Clark and Wilson in claim 1, does not teach where the method further comprises the step of providing a control signal from a controller configured to output a control signal to a system of the vehicle to implement corrective action to reduce the potential of an actual rollover when the rollover index is above a predetermined threshold.

18. Applicant's admitted prior art teaches where rollover protection methods may include a step of providing a control signal from a controller to implement corrective action to reduce the potential of an actual rollover when a rollover potential is above a threshold (**see Applicant's specification page 1**).

19. It would be obvious to one skilled in the art to modify Watson, as modified by Yeh, Clark and Wilson in claim 1, with Applicant's admitted prior art because this can prevent a vehicle from rolling over rather than simply detect a rollover.

20. **Regarding claim 7**, Watson, as modified by Yeh, Clark and Wilson in claim 1 and further modified by Applicant's admitted prior art in claim 6, teaches where the corrective action includes at least one of engine torque reduction, a steering wheel angle adjustment, and a suspension adjustment (**see Applicant's specification pages 1, 2)**.

21. **Regarding claim 8**, Watson, as modified by Yeh, Clark and Wilson in claim 1 and further modified by Applicant's admitted prior art in claim 6, teaches where the engine torque reduction includes at least one of a change in engine output and actuation of vehicle brakes (**see Applicant's specification page 1 regarding differential braking**).

Conclusion

Any inquiry concerning this or any earlier communication from the examiner should be directed to Examiner Peter Nolan, whose telephone number is 571-270-7016. The examiner can normally be reached Monday-Friday from 7:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black, can be reached at 571-272-6956. The fax number for the organization to which this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Peter D Nolan/

Examiner, Art Unit 3661

3/18/2010

/Thomas G. Black/

Supervisory Patent Examiner, Art Unit 3661